

CHICKAMAUGA NATIONAL MILITARY PARK TOUR ROADS, HAER No. GA-95-A  
ALEXANDER'S BRIDGE  
Chickamauga and Chattanooga National Military Park  
Fort Oglethorpe Vicinity  
Catoosa County  
Georgia

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD  
SOUTHEAST REGIONAL OFFICE

National Park Service  
U.S. Department of the Interior  
100 Alabama Street SW  
Atlanta, GA 30303

# HISTORIC AMERICAN ENGINEERING RECORD

## CHICKAMAUGA NATIONAL MILITARY PARK TOUR ROADS, ALEXANDER'S BRIDGE

HAER No. GA-95-A

Location: Chickamauga Battlefield Unit, Chickamauga and Chattanooga National Military Park, Alexander's Bridge Road at the confluence of West Chickamauga Creek and Gordon's Slough, Catoosa County, Georgia

U.S.G.S. 7.5 minute East Ridge, Georgia quadrangle  
Universal Transverse Mercator coordinates: 16.661798.3863928

Present Owner: U.S. Department of the Interior, National Park Service, Chickamauga and Chattanooga National Military Park

Present Use: Vehicular Bridge

Significance: Alexander's Bridge, the Connecting Roadway (HAER No. GA-95-B), and Gordon's Slough Bridge (HAER No. GA-95-C) are contributing features to the Chickamauga and Chattanooga National Military Park. The National Military Park is listed on the National Register of Historic Places as a discontinuous historic district. Alexander's Bridge, the Connecting Roadway, and Slough Bridge are contributing features of the 1890-1942 Commemorative Period.

There has been a bridge spanning West Chickamauga Creek in this location dating back to the Battle of Chickamauga. The wooden structure comprising Alexander's Bridge, which may have been present at the time of the battle, was badly deteriorated and replaced in 1897 with a new wooden bridge built on limestone abutments under the authority of the Chickamauga and Chattanooga National Military Park Commission. In 1907, this wooden bridge was replaced with the current steel pony truss structure using the stone abutments already in place, having been constructed in 1897 as part of the initial park development. Slough Bridge was built in 1907 with limestone used for the abutments. It is not known if a bridge existed at Gordon's Slough during the time of the 1863 Battle.

Alexander's Bridge was also documented as part of HAER No. GA-95.

Historian: William M. Brockenbrough, Brockington and Associates, Inc.  
December 2010

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I. Project Information

In July 2010, the National Park Service, Denver Service Center (NPS-DSC), contracted with Brockington and Associates, Inc., to prepare Historic American Engineering Record (HAER) Documentation of Alexander's Bridge, Gordon's Slough Bridge and the Connecting Roadway and provide the documentation to NPS-DSC, the Georgia State Historic Preservation Office (SHPO), National Park Service, Southeast Regional Office (NPS-SRO), and other interested parties as required under the National Historic Preservation Act. The National Park Service (NPS), in cooperation with the Federal Highway Administration (FHWA), Eastern Federal Lands Highway Division (EFLHD) proposes to rehabilitate or replace Alexander's Bridge, Gordon's Slough Bridge and the Connecting Roadway.

Senior Historian William M. Brockenbrough of Brockington and Associates, Inc., prepared the HAER Documentation; including the historic narrative, measured drawings, and large-format photography. Field work, including measurements and photography, was conducted in August 2010. The HAER Documentation was completed in December 2010.

II. Physical Description of Alexander's Bridge

Alexander's Bridge spans West Chickamauga Creek at Alexander's Bridge Road on the eastern boundary of the Chickamauga Battlefield and serves as a secondary entrance point for visitors entering the National Military Park. Gordon's Slough Bridge (HAER No. GA-95-C), spanning Gordon's Slough, a tributary of West Chickamauga Creek, is located approximately 300 feet to the south of Alexander's Bridge, separated by a ninety degree bend comprised of a raised connecting roadway (HAER No. GA-95-B). Both bridges date to 1907, with the Alexander's Bridge abutments having been constructed in 1897. The abutments for Gordon's Slough Bridge were constructed in 1907, at which time the roadway was probably enlarged or reconstructed to its present form. The bridges' location is tied to the crossing point at which Confederate troops were prevented from crossing Chickamauga Creek during the events leading up to the Battle of Chickamauga.

Two stone monuments and a cast iron tablet are located in the vicinity of Alexander's Bridge. The stone monuments, dedicated to Indiana troops, are positioned on the north side of West Chickamauga Creek on either side of Alexander's Bridge Road. An iron plaque commemorating Walthall's Brigade is positioned on the roadside just south of Alexander's Bridge. Plaques and monuments were placed by veterans of the battle to mark troop movements and commemorate the actions of the battle.

The National Military Park, having been established by the U.S. Congress in 1890, experienced its initial phase of development between that year and 1895. It is not known if the wooden bridge that comprised Alexander's Bridge at the time of the National Military Park's initial development was the bridge that was present at the time of the battle. By 1897, however,

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the bridge had deteriorated to the point that it was condemned by National Military Park officials and closed to traffic. By July of that year, work began on constructing a new bridge and permanent abutments. The stone abutments supporting the current Alexander's Bridge were constructed in 1897 of local limestone at a cost of \$1,450.00.<sup>1</sup> Designed by the National Military Park's engineer, Edward E. Betts, the abutments originally supported a wood king truss bridge constructed during the initial years of the National Military Park's development (Figures 1 and 2). The stone abutments were left in place when, in 1907, a new steel pony truss bridge was constructed and installed by the Nashville Bridge Company (Figures 3-7). Betts favored the use of steel over wood, as the latter deteriorated at a fast rate and was expensive to construct and maintain due to the lack of available materials and tradesmen.<sup>2</sup> It is probable that the steel bridge was designed entirely by the Nashville Bridge Company; the drawings that Betts drew in 1906 and supplied to the bridge company indicate only the distance between bridge seats, 76'-3".

The bridge is designed as a Warren Truss with verticals, a design used from the mid-nineteenth century until the twentieth century. Constructed of plate and angled steel, all members are fastened with rivets. The steel is currently painted yellow. The pony truss rests directly on the stone bridge seats, while the bridge deck, installed sometime in the 1970s, is slightly elevated from the stone bridge seats. The newer bridge deck is installed on steel stringers and replaced an earlier bridge deck constructed of wood.

### III. Construction of Alexander and Slough Bridges

From the National Military Park's initial inception, efforts focused on developing the Chickamauga Battlefield as a commemorative landscape of fields and roads for the purpose of interpreting the events of 1863. Work in the period between 1890 and 1892 focused on the entrance roads to the battlefield and later on clearing the fields and underbrush, and re-establishing existing roads. Work crews of up to 40 men were enlisted for these tasks, which continued until the turn of the century.<sup>3</sup> By the early 1900s, work focused on maintenance, and by 1907, the existing wooden Alexander's Bridge, having been constructed in 1897 at the same time as the stone abutments, was in need of replacement.

The 1907 Annual Report of the Chickamauga and Chattanooga National Park Commission indicates that Congress appropriated \$1,500 for the partial reconstruction of Alexander's Bridge. While plans and specifications were prepared for a new bridge, and

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<sup>1</sup> Carman, General B. A. to Edward E. Betts, June 14, 1906. Chickamauga and Chattanooga National Military Park Archives, Chickamauga Battlefield Unit, Fort Oglethorpe, Georgia.

<sup>2</sup> Ibid.

<sup>3</sup> Paige, John C. *Administrative history of Chickamauga and Chattanooga National Military Park*. Denver Service Center, Denver, Colorado, National Park Service, U.S. Department of the Interior, 1983.

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proposals were solicited, all of them were deemed too costly and rejected. A second set of plans and specifications were prepared by Betts and proposals solicited, with the Nashville Bridge Company submitting the successful proposal for \$1,500.<sup>4</sup> It is not apparent what changes were made to the plans and specifications to meet Congress's appropriated amount. The 1907 Annual Report further stated that work on the bridge was to take approximately ten days, and that the approaches at either end were also to be improved.

The following year's Annual Report states that "during the year past Alexander's bridge over the Chickamauga has been completed, the cost of which was \$1,500. The bridge is of steel and concrete with a 75 foot span and a 16 foot roadway."<sup>5</sup> The report indicates that the bridge system for the National Military Park was completed in 1908 and that:

The completed system consists of 16 bridges large and small erected at a total cost of \$20,667.36 as follows. Alexander's bridge over the Chickamauga; a low steel bridge with oak floor 75 feet in length with a 16 foot roadway erected upon first class masonry abutments. It was built in 1907 to replace a wooden structure and the cost was \$1,500. Gordon's slough just east of Alexander's; a steel girder bridge, 18 feet span and 16 feet roadway, reinforced concrete floor with gravel surface, rubble masonry abutments laid in Portland cement. This bridge was built in 1907 at a cost of \$482.60.<sup>6</sup>

During this period, most bridges were built by local builders or engineers.<sup>7</sup> By the late nineteenth and early twentieth century, bridges were more often constructed by bridge companies, many of which sold their bridges to counties and municipalities through catalogs. Metal truss bridges were ideal for this format of sales, design, and construction. The individual members of the truss were fabricated in the bridge company's shop, and then sent by rail to the bridge site to be constructed by local agents and laborers.<sup>8</sup> Figure 2 shows these members shortly after delivery to the Alexander's Bridge site. This process lead to standardization of bridge designs within individual companies. As park engineer, Betts would have had the authority to choose the bridge company. It is probable that Betts had worked with the Nashville

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<sup>4</sup> *Report of the Chickamauga and Chattanooga National Military Park Commission*. U.S. War Department, Chickamauga and Chattanooga National Military Park Commission. Washington D.C., 1907.

<sup>5</sup> Ibid.

<sup>6</sup> Ibid

<sup>7</sup> Carver, Martha. *Tennessee's Survey Report for Historic Highway Bridges*. Tennessee Department of Transportation, 2008. p. 152.

<sup>8</sup> Ibid

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Bridge company previously; the firm's owner Arthur Dyer grew up in and attended high school in Chattanooga.

IV. Edward E. Betts

Edward E. Betts served as engineer in charge of the Chickamauga and Chattanooga National Military Park from 1892 to 1911. His first task after being appointed was to supervise the mapmaking process and erection of monuments, as well as to oversee the restoration of the battlefield to its battle period appearance.<sup>9</sup> His service at the National Military Park was punctuated by many of the early development projects that shaped its creation. He designed the Wilder Brigade Monument, surveyed the land and laid out the National Military Park including the roads, bridges, and drainage structures. During this early period, he also consulted on the development of the Vicksburg National Military Park.<sup>10</sup> Betts was sent to Vicksburg to re-do the previous engineers work, which caused much controversy with the chairman of that park.<sup>11</sup>

One of Betts' more visible accomplishments at Chickamauga and Chattanooga National Military Park is the design and construction of the entrance to Point Park on the Lookout Mountain Battlefield. The castle-like entrance gate features twin crenulated turrets drawing from the symbolism already in use by the U.S. Army Corps of Engineers. Betts also compiled for the Park Commission two editions of maps documenting troop movements during the Battle of Chickamauga and the Battles for Chattanooga, which were then published in atlas form. Upon publication, the *New York Times* noted the maps were "the most accurate and elaborate battle maps yet issued by the government, as they represent a restoration of all the fields from accurate topographic surveys."<sup>12</sup>

Although Betts was credited with being the foremost battlefield preservationist of the period, his work was not without controversy. In 1896, Betts was accused of wasting government money at the National Military Park and of being in "collusion" with contractors by receiving a cut of the contracts he administered.<sup>13</sup> He was later exonerated by all charges by the commission.

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<sup>9</sup> Smith, Dr. Timothy B. *A Chickamauga Memorial: The Establishment of America's First Civil War National Military Park*. Knoxville, Tennessee: The University of Tennessee Press, 2009.

<sup>10</sup> Barksdale, Irene M. "Mr. Betts Looks Back." *Chattanooga Times*. Unknown Date.

<sup>11</sup> Smith, Dr. Timothy B. *A Chickamauga Memorial: The Establishment of America's First Civil War National Military Park*.

<sup>12</sup> Ibid.

<sup>13</sup> Ibid.

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In December 1898, after the departure of the troops that had assembled at Chickamauga Battlefield for the War with Spain, all National Military Park employees were placed under the direction of Betts. Previously the National Military Park had been run by an on-site assistant superintendent, William Tillman, and a staff of six whom all resided at the battlefield.<sup>14</sup> Under Betts supervision were five rangers, a rodman, a bookkeeper, a stenographer, an office boy doubling as a draftsman and photographer, a painter, a carpenter, a general laborer, and a stableman-driver. In 1906, Betts earned a salary of \$2,400.<sup>15</sup>

Betts resigned his post as engineer at the National Military Park in 1911 in order to work for Hamilton County, Tennessee, serving both positions for a short time. His tenure as engineer for the county only lasted a year before he entered private practice in 1912, setting up his own firm, Betts Engineering. Betts Engineering eventually came to be known as Betts and Associates, and is considered the oldest engineering company in Tennessee, having been established by Betts in 1913 and taken over by his son Clifford A. Betts Sr. in 1927. Edward E. Betts retired from practice in 1931. Betts grandson, Clifford A. Betts Jr. took over the firm in 1965.<sup>16</sup> Betts was very active in, and a lifetime member of, the American Society of Civil Engineers.

Betts is credited with having a role in every major engineering project in Chattanooga from 1886 until his retirement in 1931.<sup>17</sup> He first came to Chattanooga as a young engineer working on the construction of the New Orleans and Northeastern Railway in 1880. He returned six years later while working on the Chattanooga-Lookout Mountain Broad Gauge Railroad.<sup>18</sup> Betts was first married to Miss Sarah Aull, and after her death to her sister Idola Aull.<sup>19</sup>

Betts served as assistant resident engineer for the construction of the Walnut Street Bridge, opened in 1891 as the first highway bridge to span the Tennessee River in Chattanooga. Other projects included the Crest Road on Missionary Ridge, Hooker Road, McFarland Gap Road, and others constructed or maintained by the Federal Government as part of the National Military Park.<sup>20</sup>

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<sup>14</sup> Paige, John C. *Administrative history of Chickamauga and Chattanooga National Military Park*.

<sup>15</sup> Ibid

<sup>16</sup> Wilcox, Pat. "City Agrees to Sell Cliff Betts Jr. Plaque from Walnut Street Bridge." *Chattanooga Times*. October 7, 1981.

<sup>17</sup> Barksdale, Irene M. "Mr. Betts Looks Back." *Chattanooga Times*. Unknown Date.

<sup>18</sup> Ibid

<sup>19</sup> "Edward E. Betts, Engineer, Is Dead." *Chattanooga Times*. January 19, 1945.

<sup>20</sup> Ibid

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V. The Nashville Bridge Company

The Nashville Bridge Company had its beginnings in the early 1900s when Arthur Dyer transitioned out of working for the Youngstown Bridge Company and the American Bridge Company to a private venture with H. T. Sinnott. Dyer purchased Sinnott's interest in the company in 1902, ending the partnership yet for several years maintaining the firm name of the H. T. Sinnott Bridge Company until 1907.

Dyer, born in Massachusetts in 1868, was raised in Chattanooga, Tennessee. The family moved to Chattanooga after Dyer's father's service in the Union Army during the Civil War. After moving to Chattanooga in 1871, Arthur Dyer graduated from Chattanooga High School in 1887 and Vanderbilt Engineering School four years later. It was not until 1945, however, that he finalized his engineering degree, having been unable to complete his final required year at Vanderbilt.

Dyer's first job after graduation was for the Phoenix Iron Company of Phoenixville, Pennsylvania, and subsequently the Phoenix Bridge Company. After this he changed jobs with some frequency, working for the Light House Board in 1894 and the Milliken Brothers in New York in 1895. By 1904, Dyer had organized his firm into the Nashville Bridge Company and established its headquarters on the banks of the Cumberland River in downtown Nashville. Commissions came in from throughout the southeast as well as Central America where the firm worked for some time.<sup>21</sup>

Federal legislation passed in 1916 called for the standardization of bridge designs, greatly changing the nature of the bridge building industry. Many smaller firms did not adapt well to the expanding federal regulations and standardization of designs, and later the great depression, however, the Nashville Bridge Company was able to diversify by establishing itself in the marine construction industry. In 1915, the company built a floating derrick hull for the U.S. Army Corps of Engineers, marking the beginning of the firm's long history in the industry. Over the years, bridge and structure construction came to play a minority role in the company. By the 1960s, the Nashville Bridge Company had become the world's largest manufacturer of inland barges, and by 1972 sold off the bridge and structural operations. The Dyer family remained involved in the company up until its sale in 1972.<sup>22</sup>

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<sup>21</sup> Carver, Martha. *Tennessee's Survey Report for Historic Highway Bridges*.

<sup>22</sup> Ibid



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At least nine bridges constructed by the Nashville Bridge Company have been documented for the Historic American Engineering Record.<sup>23</sup> The 1902 Moore Road Bridge in Bedford County, Tennessee is one of the earliest known metal truss bridges constructed by the company.<sup>24</sup>

VI. Sources

Barksdale, Irene M. "Mr. Betts Looks Back." *Chattanooga Times*. Unknown Date, located at the Chattanooga Public Library, clippings files.

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<sup>23</sup> Library of Congress search results for "Nashville Bridge Company." August 26, 2010.

<sup>24</sup> Moore Creek Bridge, HAER No. TN-3.

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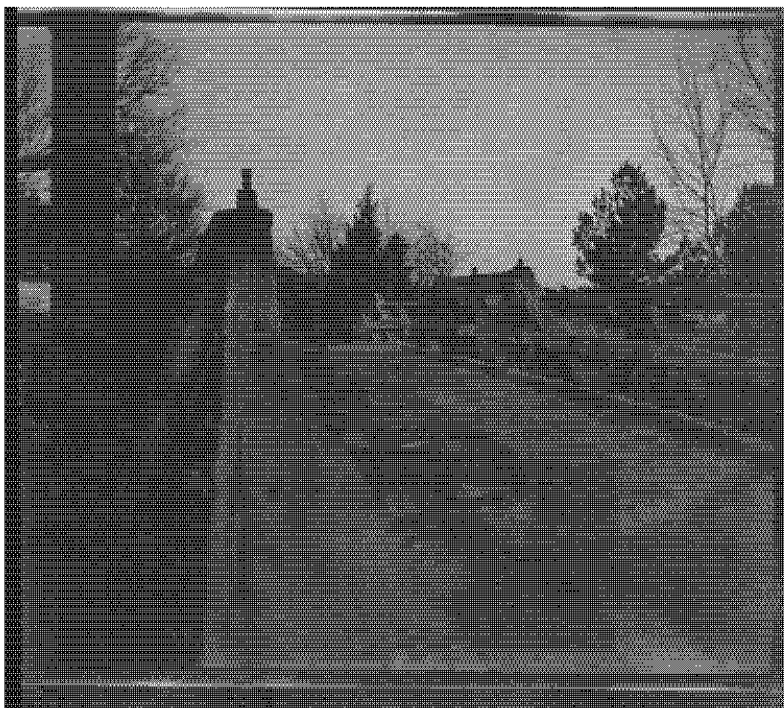


Figure 1. View of wooden bridge at Alexander's Bridge sometime before 1907.

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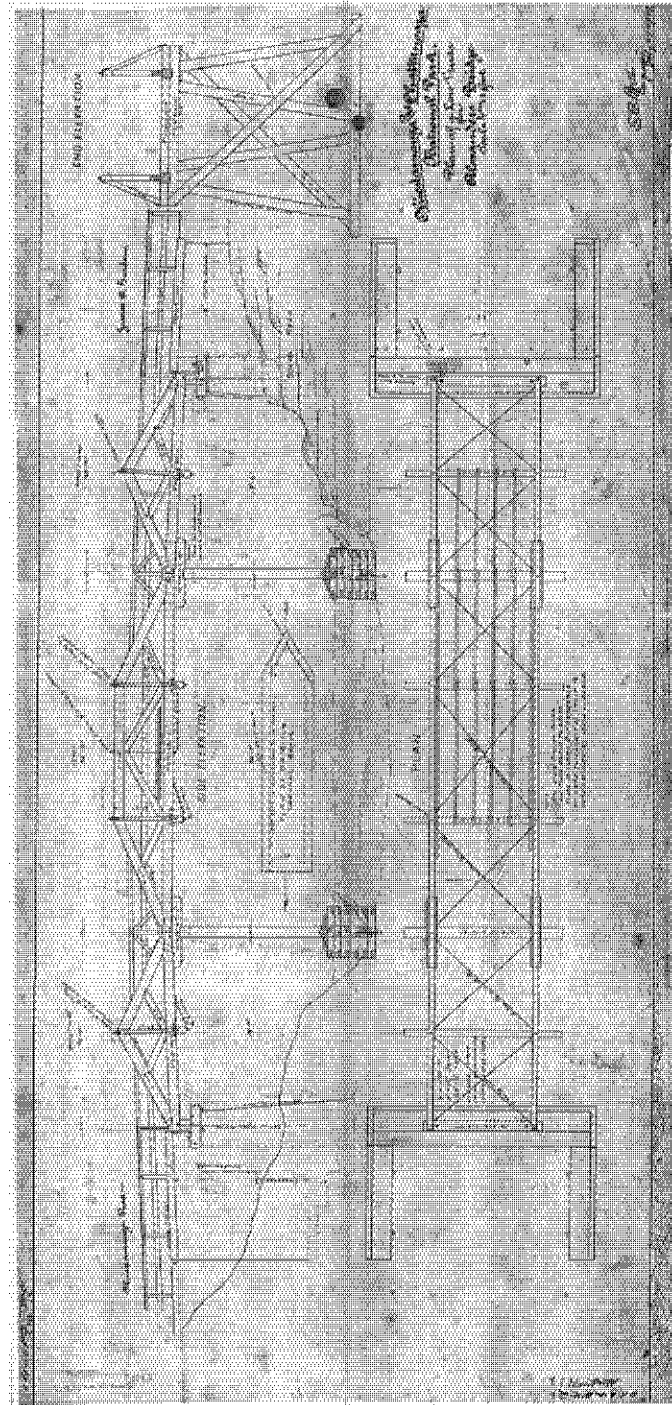


Figure 2. "Plan of a Low Truss for Alexander's Bridge," Edward E. Betts, July 27, 1897 showing first park-era wooden bridge and stone abutments still in use today.

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Figure 3. Partially assembled truss members delivered to site of Alexander's Bridge, August 1907.

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Figure 4. Alexander's Bridge, General view of trusses in position floor beams not yet in place, August 1907.

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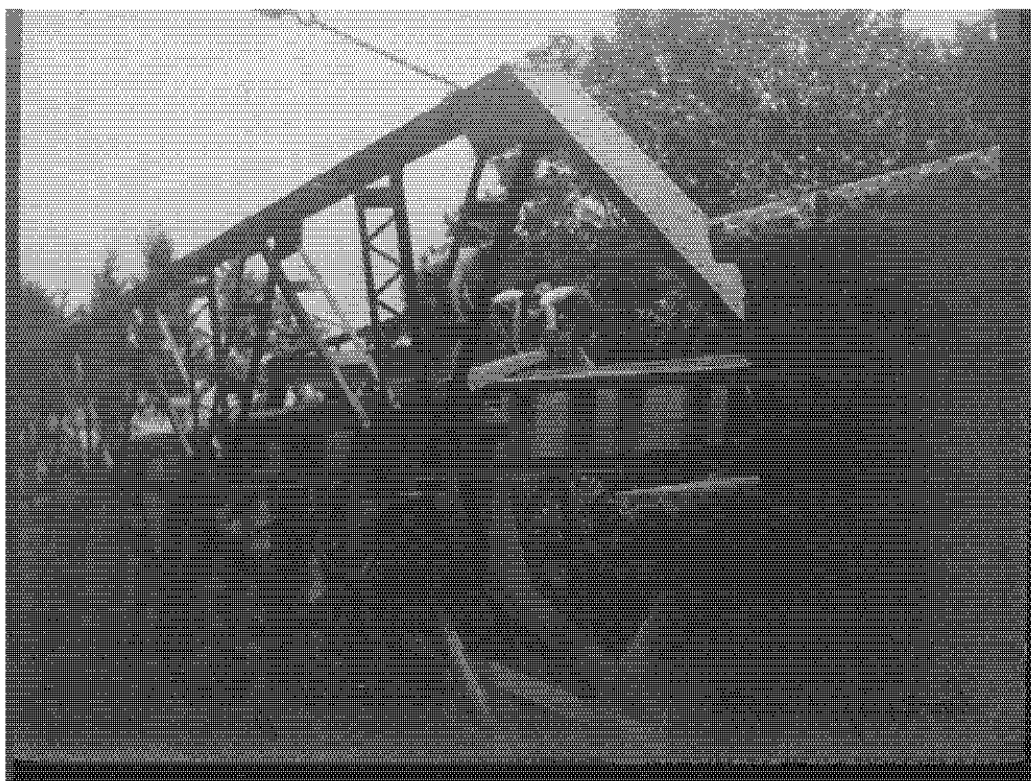


Figure 5. Alexander's Bridge under construction, August 1907.

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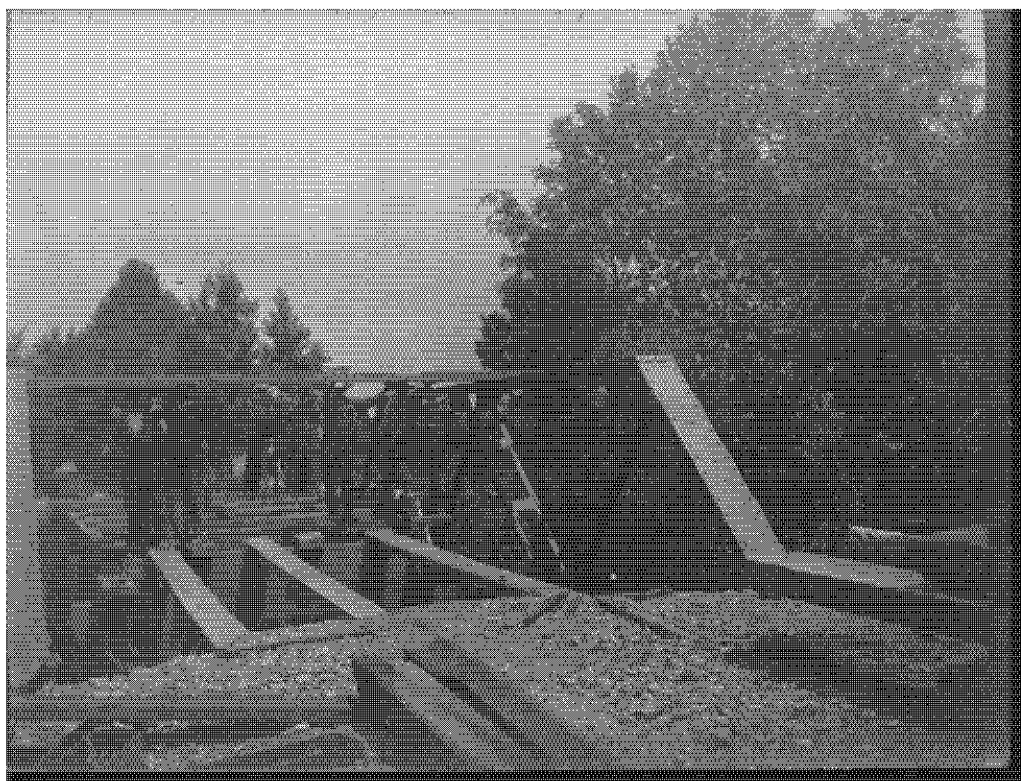


Figure 6. Alexander's Bridge trusses in position preparatory to riveting together, August 1907.

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Figure 7. View of Alexander's Bridge sometime after end of construction.